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| S2 | 10 | ("6415396" "6606740" "20010033 340" "20020194393" "6205575"). PN. | US_PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2004/11/05 13:30 |
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| S4 | 0 | GUI same (Live adj sequence adj chart) | US_PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2004/11/05 14:27 |
| S5 | 0 | GUI same (Live with sequence with chart) | US_PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2004/11/05 14:27 |
| S6 | 9 | GUI and (Live with sequence with chart) | US_PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2004/11/05 14:27 |
| S7 | 3 | (formal with system with behavior with specification\$1) and GUI | US_PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2004/11/05 14:28 |

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|-----|-----|----------------------------------------------------------|---------------------------------------------------------|----|-----|------------------|
| S8 | 11 | (formal with system with behavior with specification\$1) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2004/11/05 14:28 |
| S9 | 125 | 717/105.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2004/11/05 14:33 |
| S10 | 231 | 717/109.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2004/11/05 14:35 |
| S11 | 238 | 345/763.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2004/11/05 14:35 |


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Relevance scale

- 1** [Research track: A two-way visualization method for clustered data](#)

Yehuda Koren, David Harel

 August 2003 **Proceedings of the ninth ACM SIGKDD international conference on Knowledge discovery and data mining**

 Full text available: [pdf\(1.15 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We describe a novel approach to the visualization of hierarchical clustering that superimposes the classical dendrogram over a fully synchronized low-dimensional embedding, thereby gaining the benefits of both approaches. In a single image one can view all the clusters, examine the relations between them and study many of their properties. The method is based on an algorithm for low-dimensional embedding of clustered data, with the property that separation between all clusters is guaranteed, reg ...

Keywords: dendrogram, hierarchical clustering, information visualization

- 2** [Recursion in logics of programs](#)

David Harel

 January 1979 **Proceedings of the 6th ACM SIGACT-SIGPLAN symposium on Principles of programming languages**

 Full text available: [pdf\(1.10 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

The problem of reasoning about recursive programs is considered. Utilizing a simple analogy between iterative and recursive programs viewed as infinite unions of finite terms, we carry out an investigation analogous to that carried out recently for iterative programs. The main results are the arithmetical completeness of axiom systems for (1) *context-free dynamic logic* and (2) its extension for dealing with *infinite computations*. Having the power of expression of these logics in mi ...

- 3** [Nondeterminism in logics of programs](#)

David Harel, Vaughan R. Pratt

 January 1978 **Proceedings of the 5th ACM SIGACT-SIGPLAN symposium on Principles of programming languages**

 Full text available: [pdf\(1.20 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

We investigate the principles underlying reasoning about nondeterministic programs, and present a logic to support this kind of reasoning. Our logic, an extension of dynamic logic ([22] and [12]), subsumes most existing first-order logics of nondeterministic programs, including that developed by Dijkstra based on the concept of weakest precondition. A significant feature is the strict separation between the two kinds of nonterminating computations: infinite computations and failures. The logic h ...

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Relevance scale **1 Posters: Specifying and executing requirements: the play-in/play-out approach**

Rami Marely, David Harel, Hillel Kugler

November 2002 **Companion of the 17th annual ACM SIGPLAN conference on Object-oriented programming, systems, languages, and applications**Full text available:  pdf(219.29 KB) Additional Information: full citation, abstract, references

A powerful methodology for specifying scenario-based requirements of reactive systems is described, in which behavioral requirements are "played in" directly from the system's GUI or some abstract version thereof, and full behavior can then be "played out" freely, just as if a conventional system model were present. The approach is supported and illustrated by a tool we have built, which we call the *play-engine*. The ideas appear to be relevant to many stages of system development, includi ...

Keywords: UML, requirements engineering, scenarios, system modeling and execution, testing

2 Demos: Smart play-out

David Harel, Hillel Kugler, Rami Marely, Amir Pnueli

October 2003 **Companion of the 18th annual ACM SIGPLAN conference on Object-oriented programming, systems, languages, and applications**Full text available:  pdf(79.70 KB) Additional Information: full citation, abstract, references, index terms

We describe "smart play-out", a new method for executing and analyzing scenario based behavior, which is part of the Play-In/Play-Out methodology and the Play-Engine tool. Behavior is "played in" directly from the system's GUI, and as this is being done the Play-Engine continuously constructs Live Sequence Charts (LSCs), a powerful extension of sequence diagrams. Later, behavior can be "played out" freely from the GUI, and the tool executes the LSCs directly, thus driving the system's behavior. ...

Keywords: LSCs, UML, object-oriented analysis and design, play-out, scenarios, system modeling and execution

3 Multiple instances and symbolic variables in executable sequence charts

Rami Marely, David Harel, Hillel Kugler

November 2002 **ACM SIGPLAN Notices , Proceedings of the 17th ACM SIGPLAN conference on Object-oriented programming, systems, languages, and applications**, Volume 37 Issue 11Full text available:  pdf(328.23 KB) Additional Information: full citation, abstract, references, citations, index terms

We extend live sequence charts (LSCs), a highly expressive variant of sequence diagrams, and provide the extension with an executable semantics. The extension involves support for


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Relevance scale

1 Human-computer interface development: concepts and systems for its management

H. Rex Hartson, Deborah Hix

March 1989 **ACM Computing Surveys (CSUR)**, Volume 21 Issue 1Full text available: [pdf\(7.97 MB\)](#)
Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Human-computer interface management, from a computer science viewpoint, focuses on the process of developing quality human-computer interfaces, including their representation, design, implementation, execution, evaluation, and maintenance. This survey presents important concepts of interface management: dialogue independence, structural modeling, representation, interactive tools, rapid prototyping, development methodologies, and control structures. *Dialogue independence* is th ...

2 A survey of structured and object-oriented software specification methods and techniques

Roel Wieringa

December 1998 **ACM Computing Surveys (CSUR)**, Volume 30 Issue 4Full text available: [pdf\(695.28 KB\)](#)
Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

This article surveys techniques used in structured and object-oriented software specification methods. The techniques are classified as techniques for the specification of external interaction and internal decomposition. The external specification techniques are further subdivided into techniques for the specification of functions, behavior, and communication. After surveying the techniques, we summarize the way they are used in structured and object-oriented methods and indicate ways in w ...

Keywords: languages**3 IS '97: model curriculum and guidelines for undergraduate degree programs in information systems**
Gordon B. Davis, John T. Gorgone, J. Daniel Couger, David L. Feinstein, Herbert E. Longenecker
December 1997 **ACM SIGMIS Database , Guidelines for undergraduate degree programs on Model curriculum and guidelines for undergraduate degree programs in information systems**, Volume 28 Issue 1
Full text available: [pdf\(7.24 MB\)](#)
Additional Information: [full citation](#), [citations](#)
4 Specification and dialogue control of visual interaction through visual rewriting systems

P. Bottoni, M. F. Costabile, P. Mussio